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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/526,407	03/02/2005	Mathias A. Fink	28944/41030	3007

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EXAMINER	
SAINT SURIN, JACQUES M	
ART UNIT	**PAPER NUMBER**
2856	

DATE MAILED: 09/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/526,407	FINK ET AL.	
	Examiner	Art Unit	
	Jacques M. Saint-Surin	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 June 2005 and 05 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 5-13* is/are rejected.

7)☒ Claim(s) *2-4 and 8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 March 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1, 5-7 and 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fink et al. (US Patent 6,770,033) in view of Sarvazyan (Ultrasound in Med. &Biol. Document (PII S0301-5629(98)00110-0).

Regarding claim 1, Fink et al. discloses an imaging method (col. 1, lines 6-15) using shear waves for observing a diffusing viscoelastic medium containing particles (5) that reflect ultrasound compression waves, said method comprising:

a) an excitation step during which an elastic shear wave is generated in the viscoelastic medium (1), (see: col. 1, lines 47-50);

b) an observation step (ultrasound probe 6) during which the propagation of the shear wave is observed simultaneously at a multitude of points in an observation field in the viscoelastic medium (col. 1, lines 52-56), this observation step comprising the following substeps:

b1) causing an array of transducers (T1, T2, ...Tn) that are controlled independently of one another to emit into the viscoelastic medium a succession of unfocused ultrasound compression wave shots at a rate of at least 500 shots per second (col. 1, lines 58-61); and

b2) causing sound signals received from the viscoelastic medium to be detected and recorded in real time, said signals comprising the echoes generated by the unfocused ultrasound compression wave interacting with the reflecting particles in said viscoelastic medium (col. 1, lines 62-66); and

c) at least one processing step (microcomputer 4) during which:

c1) the sound signals received successively from the viscoelastic medium during substep b2) are processed in order to determine successive propagation images of the shear wave (col. 1, line 67 and col. 2, lines 1-9); and

c2) at least one movement parameter of the viscoelastic medium is determined at different points of the observation field (col. 2, lines 3-6); However, Hink et al. does not disclose during excitation step a) the elastic shear wave is caused to be generated by causing at least one focused ultrasound wave to be emitted into the viscoelastic medium by said array of transducers, the focusing and the timing of said focused ultrasound wave, and the timing of said unfocused ultrasound wave being

adapted so that at least some of said unfocused ultrasound waves penetrate into the observation field while the shear wave is propagating in the observation field, for at least some of the unfocused ultrasound wave emissions. Sarvazyan discloses the excitation focused transducer is used to generate remote shear waves. This shear wave propagates through the tissue and is detected. Various possibilities of detection of a remotely induced shear waves are also shown in Fig. 2, see: page 1420, col. 2, second and third paragraphs. It would have been obvious to one having ordinary skill in the art at the time of the invention to utilize in Fink et al. the techniques of Sarvazyan because the imaging transducer can be incorporated into the excitation transducer used for shear wave generation which may be a useful design for applications such as elasticity imaging and any appropriate imaging technique capable of detecting internal motion can be used for detection of shear waves remotely induced by radiation force of focused ultrasound thereby, making the above combination more effective by obtaining accurate and reliable data.

Regarding claim 5, Fink discloses the elastic shear wave produced by the loudspeaker 2 moves with a relatively low speed Cs, producing internal motions in the observed viscoelastic medium 1, see: col. 5, lines 31-34.

Regarding claims 6, Fink discloses a method according to claim 1, in which the focused ultrasound wave emitted during excitation step a) presents a frequency f lying in the range 0.5 MHz to 15 MHz, and is emitted for a duration of k/f seconds, where k is an integer lying in the range 50 to 5000 and f is expressed in Hz (see: col. 5, lines 46-50) (see: col. 5, lines 43-50).

Regarding claim 7, Fink discloses a method according to claim 1, in which the focused ultrasound wave emitted during excitation step a) presents a frequency lying in the range 0.5 MHz to 15 MHz and is emitted during a succession of emission periods separated by rest periods, the emission periods following one another at a rate lying in the range 10 to 1000 emissions per second (col. 6, lines 5-50). Regarding claim 9, Fink discloses

Regarding claim 9, Fink discloses a method according to claim 1, in which the focused ultrasound wave emitted during excitation step a) is focused simultaneously on a plurality of points (col. 1, lines 48-58).

Regarding claim 10, Fink discloses a method according to claim 1, in which image processing step c) is followed by a mapping step d) during which, on the basis of variation in the movement parameter over time, at least one shear wave propagation parameter is calculated at least some points of the observation field in order to determine a map of said propagation parameter in the observation field (col. 3, lines 37-42).

Regarding claim 11, Fink discloses A method according to any preceding claim 1, in which the shear wave propagation parameter which is calculated during mapping step d) is selected from shear wave speed, shear modulus, Young's modulus, shear wave attenuation, shear elasticity, shear viscosity, and mechanical relaxation time (col. 3, lines 43-47.

Regarding claim 12, Fink discloses a method according to claim 11, in which steps a) to d) are repeated successively while emitting different focused ultrasound

waves during successive excitation step a), and then combining the maps obtained during the successive mapping step d) in order to calculate a combination map of the observation field (col. 4, lines 4-18).

Regarding claim 13, it is similar in scope with claim 1 and therefore, it is rejected for the reasons set forth for that claim.

Allowable Subject Matter

4. Claims 2-4 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacques M. Saint-Surin whose telephone number is (571) 272-2206. The examiner can normally be reached on Mondays to Fridays between 10:30 A.M and 800 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov.

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jacques M. Saint-Surin
September 16, 2006

HEZRON WILLIAMS
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